

Zero Retries issue 0068 2022-10-14

Zero Retries is an independent email newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience. It's free (as in beer) to subscribe.

About Zero Retries

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Request To Send

Now that it's mid-October, it's unusually *still* a gorgeous Fall here in Bellingham Washington with sunny clear days, crisp nights, and no rain to speak of. As I write this in the early hours, it's *just* chilly enough to begin using the modest heating system I have in my office to offset the chill.

Sponsorships - Failed Experiment

I introduced the idea of sponsorships of Zero Retries in Zero Retries 0058 in early August. To date, there hasn't been any interest in sponsorships, so as of this issue, I'm considering that idea a failed experiment.

The idea of sponsorships came from a mention in a newsletter that suggested "make it possible for those passionate about your project to give you money". That seemed worth a try, and I have some ideas about improving Zero Retries that could be accelerated with some revenue. Thus I added the sponsorship section and the "Pseudosponsor" mention at the top of each issue to illustrate how a Zero Retries sponsorship would work. I specifically *didn't* solicit sponsorships from any organization or company because then Zero Retries would be "work", and I want to use my enthusiasm and energy for writing Zero Retries.

Zero Retries Pseudo Podcast

In Zero Retries 0053, I mentioned

Zero Retries Podcast - In Development

A special Zero Retries reader I talked with at Hamvention asked if I would consider creating a podcast version of Zero Retries. They would love to read Zero Retries, but their reading time is limited by a busy career and family obligations. But, they have time for audio content during commutes and bike rides.

A podcast version of Zero Retries is still on the development list. However, I recently opened the [Substack app](#) and when I tapped on a story to read I spotted a new "Headphones" icon in the upper right corner. I tapped it, and a machine voice started reading the publication. It was pleasant, and the pace and timing was pretty good, unlike some machine voices. It's not quite a podcast (for one, it's only available in the Substack app, not in your favorite podcast app), but hopefully for the "special Zero Retries reader", it will make it possible for them to keep up with the torrid pace of Zero Retries - while bicycling.

de Steve N8GNJ

N8GNJ Labs Joins the Space Age

In Zero Retries 0053, I teased

To my delight, a *big* package of fun distraction arrived recently that fulfills a dream I've had since I was a kid during the Space Race and was later re-ignited with a "passion" stint during my paycheck career. More about that project in a few issues when I've had time to play with it.

It's now a few issues later, and I can reveal that the package was my [Starlink](#) residential user terminal.

The following descriptions / scenarios / experiences are my perceptions and to the best of my knowledge as I write this article. Your knowledge and experience may vary.

To get some sticking points about Starlink out of the way up front (that cause a lot of conversation-stopping *but...*, *but...*, *but...*s):

- If you have reasonable options for broadband Internet access such as fiber or cable or (outside the US, high speed DSL), or some of the better Wireless ISPs that take quality of service seriously, *those* are probably better and cheaper options than Starlink. I'm included in that category - I have access to Comcast cable service. *My* choice to invest in Starlink isn't out of necessity, but rather personal curiosity (as you'll read below).
- Using Starlink requires *purchase* of a user terminal - \$600 (for the residential unit); there's no \$10/month rental option like there is for a cable modem.
- The *cheapest* Starlink service (in the US) is the residential plan - \$110 monthly. If you want to use your Starlink terminal away from home (Starlink for RVs) that's \$135 / month. Once you have purchased a Starlink terminal, you can start and stop Starlink service on a month-to-month basis on the Starlink website.
- For the consumer versions, Starlink offers *no guarantees* on performance or availability. Starlink service for consumers is purely best effort and can be impacted by the availability of the satellite constellation, atmospheric conditions, infringement on the line of sight to the satellites (trees), usage (especially oversubscription in certain areas, like urban areas in California), snow, and... outdoor cats. ([Nope, not a joke.](#))
- Yes, the density of the Starlink constellation impacts terrestrial optical astronomy.
- Yes, Starlink (a product of SpaceX) is one of Elon Musk's ventures, and Elon Musk is... well, *Elon Musk* for better or worse depending on your perspective.

I cheerfully admit / confess / disclaim *all* of those issues up front. Now... the fun stuff.



Model of early Telstar satellite - Image courtesy of Wikipedia

My childhood fascination with satellite technology wasn't Sputnik (though that was cool, of course), but rather AT&T's first two [experimental Telstar communications satellites](#). I can't tell you why, to this day, *Telstar* feels so cool to me (especially considering I was in my early childhood when they were launched), but to this day, *Telstar* = *cool*, to me. Thus I've always had a fascination for communications satellites and their associated technologies, especially experimental communications satellites.

I've had two professional encounters with cool satellite technology.

The first was in the early 1980s onboard the R/V Western Glacier (doing seismic oil exploration surveys) which was equipped with a Marisat terminal. Back then satellite communications on a ship at sea required a 5' or so gyro stabilized dish (in a radome). The Marisat terminal allowed us to have reliable communications despite being in the middle of the Bering Sea - even in the stormy early winter months. Telephone calls on Marisat at that time cost \$10/minute (but had the benefit of being private, in contrast to the 1000 watt Marine HF radio that was our primary mode of communication). In the last phase of that job in Alaska, I occasionally called my then fiancé (now my wife) and billed it to my Dad's telephone line. That was only acceptable because Dad was getting my paychecks and deducted those \$90 phone calls as soon as the phone bill arrived.

My second encounter with satellite technology was during my career at Boeing when I was fortunate enough to be one of the IT support crew for the large Boeing contingent of engineers working at [Teledesic](#) trying to make that system a reality. There are stories to be told from that experience.

With that background, I began following Starlink from the first mentions of it as a potential project, then in beta, then in production. I had acceptable Internet so I decided to wait for Starlink to be out of beta. I "applied", and eventually, I got the coveted email from Starlink, and I spent the equivalent of a new radio buying a Starlink terminal because, well, it's *Satellite and Internet!*

Yeah, I know that there's been Internet via satellite since [ALOHANet](#), and I could have pulled the trigger on Satellite and Internet at any time via (geostationary) [HughesNet](#) or [Viasat](#). Those two options weren't that interesting to me because they're generally a poor Internet experience, they're expensive and limited (transfer caps), and they can only be installed by a professional installer. Thus the "cool factor" and "tinker factor" was missing.

But Starlink...

Last weekend a few buddies - Peter WA7FUS, Bill W7NWP, and Doug K7IP were at my home and I decided *that* was the time to unbox Starlink. I'll spare you the unboxing - there are [ample videos available](#).



Initial Starlink terminal testing at N8GNJ Labs - 2022-10-08 - Steve Stroh N8GNJ

Suffice it to say, from cutting the tape on the box, to four of us on our phones having broadband Internet access via Starlink's Wi-Fi, was less than 5

minutes, a minute or so of that was spent deciding on a Wi-Fi name and a password. I placed the user terminal, low to the ground with the included stand, at the edge of my large driveway. The user terminal oriented itself to point North, and it as fast as we could connect to the Wi-Fi, we had broadband Internet.

If I had a generator or large battery bank, it would have been standalone. (There's no DC power option, other than some severe hacking, which I wouldn't bother to do.)

To me, this experience was almost surreal - broadband Internet from space.

The implications of this capability for Amateur Radio and emergency / highly reliable communications are profound, and I'll explore that in future issues of Zero Retries.

Short term, I have to decide on a mounting system for the Starlink terminal for N8GNJ Labs - there are [many options available](#). Two accessories worth knowing about for Starlink are a [Mesh Wi-Fi Router](#) that extends the range of Wi-Fi, and an [Ethernet adapter](#).

Lastly, [SpaceX is hiring!](#) If I was earlier in my life and career, I would try to get onboard with them, somehow, somewhere.

N8GNJ Labs is 200 Pounds Lighter - Thanks to DLARC



DLARC logo courtesy of Internet Archive

I spent a bit too much time this week preparing my first shipment of Amateur Radio material for the Internet Archive's [Digital Library of Amateur Radio & Communications](#). In the end this first shipment consisted of 4 boxes of books, magazines, and various Amateur Radio material such as a few manuals of rigs I've never owned, product brochures, etc. The weight, as shipped, was nearly 200 pounds. I forgot to take a photo of that first shipment.

Donating to DLARC was an... interesting... experience, not quite what I initially expected.

The following is my personal experience / my perceptions of the process of donating material to DLARC. I'm not speaking on behalf of Internet Archive or DLARC or Kay Savetz K6KJN, Program Manager, Special Collections, who is managing DLARC.

It's a misconception that you'll be able to empty your, or your Dad's, or your grandfather's file cabinets or collection of vintage QSTs onto DLARC. Each donation to DLARC is individually negotiated, and it's likely that your offer of magazines will be declined unless you have rare ones. QST or CQ - probably not. Magazines about Amateur Television, more likely. 73 Magazine is, delightfully, [already part of DLARC](#) from a donation by 73's founder Wayne Green W2NSD, now a silent keyboard.

Getting your donations (if approved) to Internet Archive for DLARC is also individually negotiated. I was asked to provide an inventory of the major items in my first donation, and after some back and forth I understood the rationale and agreed... but that took time.

At this point early in the life of DLARC, it's heartening to see at least a prototype of DLARC - <https://archive.org/details/dlarc>. What you'll see there is Internet Archive's typical chaotic (to me), hard-to-navigate default view. You *can* find stuff there, and you'll undoubtedly find interesting stuff you didn't know existed, but it takes some effort. How you sort things out, to me, is baffling and inscrutable. There's a lot of interesting info there, and the potential is evident. I'm told that a much better website for DLARC is being developed, but it will take time.

When I'm a bit more comfortable that the pipeline of donating material to DLARC, shipping it off, receiving it and scanning it, and eventually being available online is working smoothly, I look forward to contributing the rarer items in my personal collection such as manuals for early packet radio equipment such as the VADGC TNC, TAPR TNC-1 Kantronics D4-10 and Data Engine, Packet Radio Magazine, and much more.

A major element of working with Internet Archive / DLARC that's not mentioned up front is that once you donate something, it becomes the property of Internet Archive and cannot be returned. In fairness to IA / DLARC, that policy is no different than any other organization that accepts physical donations... but that's not mentioned up front.

ZR > BEACON

- If you're a Starlink customer that's also an Amateur Radio operator, there's a [mailing list for us!](#) My thanks to Randy Neals W3RWN for starting this list.
 - ARDC is looking for new folks for their [2023 Grants Advisory Committee](#). Note that an Amateur Radio license is not a requirement.
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Feedback Loop

- **Paul Milazzo K3PGM** re: my mourning the discontinuation of the GL-iNet GL-AR150 series in Zero Retries 0067 - *If you liked the GL-AR150, the GL-AR300M16 is a better and faster replacement in the same form factor and a similar price point. It, too, has an -EXT version with external antennae, and both are supported by the current AREDN release. The only downside is that, unlike the GL-AR150, the GL-AR300M16 cannot be upgraded to be powered over Ethernet. The GL-AR750 does have a PoE option.*
 - **Paul Elliott WB6CXC** in response to my mention of his Drift Buoy project in Zero Retries 0063 - *As I had threatened, I've been posting to my blog about the Drift Buoy development. Here are a series of posts that go into how I generate FSK for HF-APRS, WSPR, and FT8 using the incredible Si5351 clock generator chip: <http://wb6cxc.com/?p=107>.*
Recommended - Paul lays out his work in a clear, readable style.
-

Join the Fun on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything!*
- Pseudostaffer [Dan Romanchik KB6NU](#) for continuing to spot, and write about "Zero Retries Interesting" items on his blog that I don't spot on my own.
- [Amateur Radio Weekly](#) and [Southgate Amateur Radio News](#) consistently surface "Zero Retries Interesting" stories.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing newsletters.

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Leave a comment

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More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham, Washington, USA

2022-10-14

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